PART F
MAGAZINE CONSTRUCTION

WAC 296-52-700 Magazine construction. Construction of explosive storage magazines must comply with the requirements of this part and the Bureau of Alcohol, Tobacco, and Firearms (BATF) regulations.

Note: Construction requirements for blasting agent bulk storage bins are located in WAC 296-52-67140, Bulk storage bins.

WAC 296-52-70005 Class 1 magazines: Permanent storage facilities. A Class 1 storage facility must be:

- A permanent structure such as:
  - A building
  - An igloo
  - An army-type structure
  - A tunnel
  OR
  - A dugout
- Bullet resistant, fire resistant, weather resistant, theft resistant, and well ventilated.

WAC 296-52-70010 Building construction for Class 1 magazines. All building-type storage facilities must:

- Be constructed of masonry, wood, metal, or a combination of these materials
- Have no openings except for entrances and ventilation
- Have the ground around the facility slope away for drainage

(1) **Wall construction.**

(a) **Masonry wall construction.** Masonry wall construction must:

- Consist of brick, concrete, tile, cement block, or cinder block
- Be at least six inches thick

(b) **Hollow masonry construction.** Hollow masonry construction must:

- Have all hollow spaces filled with well tamped coarse dry sand
  OR
- Have weak concrete (a mixture of one part cement to eight parts sand with enough water to dampen the mixture) while tamping in place
  AND
- Have interior walls covered with a nonsparking material

(c) **Fabricated metal wall construction.**

- Metal wall construction must be securely fastened to a metal framework and consist of one of the following types of metal:
  - Sectional sheets of steel (at least number 14 gauge)
    OR
  - Aluminum (at least number 14 gauge)

- Metal wall construction must:

  - Be lined with brick, solid cement blocks, and hardwood at least four inches thick or material of equivalent strength
  - Have a minimum of six-inch sand fill between interior and exterior walls
  - Have interior walls constructed of or covered with a nonsparking material

(d) **Wood frame wall construction.**

- Exterior wood walls must be covered with iron or aluminum at least number 26 gauge
- Inner walls, made of nonsparking materials must be constructed with a space:

  - A minimum of six inches between the outer and inner walls
    AND
  - Filled with coarse dry sand or weak concrete

(2) **Floors.** Floors must be:

(a) Constructed of a nonsparking material.

(b) Strong enough to hold the weight of the maximum quantity to be stored.

(3) **Foundation.**

- Foundations must be constructed of brick, concrete, cement block, stone, or wood posts
- If piers or posts are used instead of a continuous foundation, the space under the building must be enclosed with metal

(4) **Roof.**

(a) Roofs must be covered with no less than number 26 gauge iron or aluminum fastened to a 7/8-inch sheathing, except for buildings with fabricated metal roofs.

(b) If it is possible for a bullet to be fired directly through the roof at such an angle that it would strike a point below the top of the inner walls, storage facilities must be protected by one of the following two methods:

- A sand tray must be:

  - Located at the top of the inner wall covering the entire ceiling area, except the area necessary for ventilation.
  - Lined with a layer of building paper.
  - Filled with at least four inches of coarse dry sand.

- A fabricated metal roof must be constructed of 3/16-inch plate steel lined with four inches of hardwood or material of equivalent strength. For each additional 1/16-inch of plate steel, the hardwood or material of equivalent strength lining may be decreased one inch.

(5) **Doors and hinges.**

(a) All doors must be constructed of 1/4-inch plate steel and lined with two inches of hardwood or material of equivalent strength.

(b) Hinges and hasps must be installed so they cannot be removed when the doors are closed and locked by:

- Welding
- Rivering

OR

- Bolting nuts on the inside of the door

(6) **Locks.**

(a) Each door must be equipped with:

- Two mortise locks
- Two padlocks fastened in separate hasps and staples
- A combination of a mortise lock and a padlock
- A mortise lock that requires two keys to open

OR

- A three point lock

(b) Padlocks must:

- Have a minimum of five tumblers
- Have a case hardened shackle at least 3/8 inches in diameter
- Be protected with a minimum of ¼-inch steel hoods, constructed to prevent sawing or lever action on the locks, hasps, and staples

Note: These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be operated from the outside.

(7) **Ventilation.**

- A two-inch air space must be left around ceilings and the perimeter of floors, except in doorways
- Foundation ventilators must be at least four inches by six inches
- Vents in the foundation, roof, or gables must be screened and offset

(8) **Exposed metal.**

- Sparking metal construction cannot be exposed below the tops of walls in storage facilities
- All nails must be blind nailed, countersunk, or nonsparking

WAC 296-52-70015 Igloos, army-type structures, tunnels, and dugouts. These storage facilities must:

- Be constructed of reinforced concrete, masonry, metal, or a combination of these materials
- Have an earth mound covering of at least twenty-four inches on the top, sides, and rear unless the magazine meets the requirements of WAC 296-52-70010 (4)(b), Building construction for roofs

- Have interior walls and floors covered with a nonsparking material
- Be constructed according to the requirements of WAC 296-52-70005, Class 1magazines: Permanent storage facilities, through WAC 296-52-70060, Construction.

WAC 296-52-70020 Class 2 magazines: Portable field storage. A Class 2 storage facility must:

- Be a box, trailer, semi-trailer, or other mobile facility. When an unattended vehicular magazine is used, the wheels must be removed or it must be effectively immobilized by kingpin locking devices or other methods approved by the department
- Be bullet resistant, fire resistant, weather resistant, theft resistant, and well ventilated
- Be a minimum of one cubic yard
- Be supported to prevent direct contact with the ground
- Have the ground around the magazine slope away for drainage or provide for other adequate drainage.

WAC 296-52-70025 Construction for Class 2 magazines.

(1) **Exterior, doors, and top openings.**

(a) The exterior and doors must be constructed of at least 1/4-inch steel and lined with a minimum of two-inch hardwood.

(b) Magazines with top openings must have lids with water resistant seals or lids that overlap the sides by a minimum of one inch when closed.

(2) **Hinges and hasps.** Hinges and hasps must be installed so they cannot be removed when the doors are closed and locked by:

- Welding
- Riveting

OR

- Bolting nuts on the inside of the door

(3) **Locks.**

(a) Each door must be equipped with:

- To mortise locks
- Two padlocks fastened in separate hasps and staples
- A combination of mortise lock and a padlock
- A mortise lock that requires two keys to open

OR

- A three-point lock

(b) Padlocks must have:

- A minimum of five tumblers and a case hardened shackle with a minimum of 3/8-inch diameter
- A minimum of ¼-inch steel hoods constructed to prevent sawing or lever action on the locks, hasps, and staples

Note: These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be operated from the outside.

(4) **Ventilation.**

- A two-inch air space must be left around ceilings and the perimeter of floors, except at doorways
- Foundation ventilators must be at least four inches by six inches
- Vents in the foundation, roof, or gables must be secured and offset

(5) **Exposed metal.**

- Sparking metal cannot be exposed below the top of walls in the storage facilities
- All nails must be blind nailed, countersunk, or nonsparking

Note: The following are nonmandatory construction alternatives for magazine exteriors:

- *All steel and wood dimensions shown are actual thickness*
- *The manufacturer's represented thickness may be used to meet the concrete block and brick dimensions.*

3/16

- 3/16-inch steel lined with an interior of 4-inch hardwood
- 3/16-inch steel lined with:
  - An interior of 7 inches of softwood
    OR
  - 6 3/4 inches of plywood.
- 3/16-inch steel lined with:
  - An intermediate layer of 3-inch hardwood
    AND
  - An interior lining of 3/4-inch plywood.

1/8

- 1/8-inch steel lined with an interior of 5-inch hardwood.
- 1/8-inch steel lined with an interior of 9-inch softwood.
- 1/8-inch steel lined with:
  - An intermediate layer of 4-inch hardwood
    AND
  - An interior lining of 3/4-inch plywood **.**
- 1/8-inch steel lined with:
  - A first intermediate layer of 3/4-inch plywood.
  - A second intermediate layer of 3 5/8 inches well-tamped dry sand
    OR
  - Sand/cement mixture.

An interior lining of 3/4-inch plywood.

- 5/8-inch steel lined with an interior of any type of nonsparking material.
- 1/2-inch steel lined with an interior of at least 3/8-inch plywood.
- 3/8-inch steel lined with an interior of 2-inch hardwood.
- 3/8-inch steel lined with an interior of:
    - 3 inches softwood
      OR
    - 2 1/4 inches of plywood.
- 1/4-inch steel lined with:
    - An interior of 5 inches of softwood
      OR
    - 5 1/4 inches of plywood.
- Any type of structurally sound fire resistant material lined with:
    - An intermediate layer of 4-inch solid concrete block
      OR
    - 4-inch solid brick or concrete
      AND
    - An interior lining of 1/2-inch plywood placed securely against the masonry lining.
- Standard 8-inch concrete block with voids filled with well tamped sand/cement mixture.
- Standard 8-inch solid brick.
- Any type of structurally sound fire resistant material lined with an intermediate 6-inch space filled with:
    - Well tamped dry sand
      OR
    - Well tamped sand/cement mixture.
- Any type of fire resistant material lined with:
    - A first intermediate layer of 3/4-inch plywood,
    - A second intermediate layer of 3 5/8-inch well tamped dry sand
      OR
    - Sand/cement mixture,
    - A third intermediate layer of 3/4-inch plywood,
    - A fourth intermediate layer of 2-inch hardwood
      OR
    - 14 gauge steel and an interior lining of 3/4-inch plywood,
    - 8-inch thick solid concrete.

WAC 296-52-70030 Class 3 magazines: Indoor storage facilities.

- Detonators in quantities of one thousand or less
- Ammonium perchlorate rocket motors in 62.5 gram amounts or greater, but not to exceed fifty pounds in total weight of explosives.

OR

- Diversionary devices intended for law enforcement use only, but not to exceed fifty pounds in total weight of explosives.

WAC 296-52-70035 Storage facilities for detonators. Storage facilities for detonators in quantities of one thousand or less:

- Must be fire resistant and theft resistant
- Must be locked in an uninhabited building
- May be less than one cubic yard
- Must be painted red and have an identification label in case of fire.

WAC 296-52-70040 Construction for Class 3 magazines.

(1) Sides, bottoms, and covers must be constructed with a minimum of number 12 gauge metal and lined with a nonsparking material.

(2) Hinges and hasps must be attached so they cannot be removed from the outside.

(3) One steel padlock, which does not need to be protected by a steel hood, having a minimum of five tumblers and a case hardened shackle of a minimum of 3/8-inch diameter is sufficient for locking purposes.

WAC 296-52-70045 Class 4 magazines: Blasting agent, low explosive, or electric detonator storage facilities. A Class 4 storage facility must:

- Be a building, an igloo, an army-type structure, a tunnel, a dugout, a box, a trailer, semi-trailer, or other mobile facility
- Be fire resistant, weather resistant, and theft resistant
- Have the ground around the facility slope away for drainage
- Have the wheels removed or effectively immobilized by kingpin locking devices or other methods approved by the department, when an unattended vehicular magazine is used.

Note: Test results show that electric detonators are not affected by sympathetic detonation. Therefore, a Class 4 storage facility meets the necessary requirements for storage of electric detonators.

WAC 296-52-70050 Construction for Class 4 magazines.

(1) These magazines must be constructed of masonry, metal covered wood, fabricated metal, or a combination of these materials.

(2) **Foundations.** Foundations must be constructed of:

- Brick
- Concrete
- Cement block
- Stone
- Metal

OR

- Wood posts

(3) The space under the building must be enclosed with fire resistant material, if piers or posts replace continuous foundation.

(4) The walls and floors must be made or covered with a nonsparking material or lattice work.

(5) Doors must be metal or solid wood covered with metal.

(6) Hinges and hasps must be installed so they cannot be removed when the doors are closed and locked by:

- Welding
- Riveting

OR

- Bolting nuts on the inside of the door

(7) **Locks.**

(a) Each door must be equipped with:

- Two mortise locks
- Two padlocks fastened in separate hasps and staples
- A combination of a mortise lock and a padlock
- A mortise lock that requires two keys to open

OR

- A three-point lock

(b) Padlocks must:

- Have a minimum of five tumblers
- Have a case hardened shackle of a minimum of 3/8-inch diameter
- Be protected with a minimum of ¼-inch steel hoods constructed to prevent sawing or lever action on the locks, hasps, and staples.

Note: These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be operated from the outside.

WAC 296-52-70055 Class 5 magazines: Blasting agent storage facilities. A Class 5 storage facility must:

- Be a building, an igloo, an army-type structure, a tunnel, a dugout, a box, or a trailer, semi-trailer, or other mobile facility
- Be weather resistant and theft resistant
- Have the ground around the facility slope away for drainage
- Have the wheels removed or be effectively immobilized by kingpin locking devices or other methods approved by the department, when the unattended vehicular magazine is used.

WAC 296-52-70060 Construction for Class 5 magazines.

(1) Doors must be constructed of solid wood or metal.

(2) Hinges and hasps must be installed so they cannot be removed when the doors are closed and locked by:

- Welding
- Riveting

OR

- Bolting nuts on the inside of the door

(3) **Locks.**

(a) Each door must be equipped with:

- Two mortise locks
- Two padlocks fastened in separate hasps and staples
- A combination of a mortise lock and a padlock
- A mortise lock that requires two keys to open

OR

- A three point lock

(b) Padlocks must have:

- A minimum of five tumblers
- A case hardened shackle of a minimum of 3/8-inch diameter
- Padlocks must be protected with a minimum of ¼-inch steel hoods constructed to prevent sawing or lever action on the locks, hasps, and staples.

Note: Trailers, semi-trailers, and similar vehicular magazines. Each door may be locked with one 3/8-inch diameter steel padlock and does not need to be protected by a steel hood, if the door hinges and lock hasp are securely fastened to the magazine and to the doorframe. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be operated from the outside.

WAC 296-52-70065 Explosives day box.

(1) A day box for explosives must:

- Be fire, weather, and theft resistant
- Be used in a manner that safely separates detonators from other explosives
- Be constructed of a minimum of number 12 gauge (.1046 inches) steel
- Be lined with at least either 1/2-inch plywood or 1/2-inch masonite-type hardboard
- Have doors that overlap the sides by a minimum of one inch
- Have appropriate ground slope for drainage

(2) Hinges and hasps must be attached by:

- Welding
- Riveting

OR

- Bolting nuts on the inside of the door

(3) One steel padlock, which does not need to be protected by a steel hood, having a minimum of five tumblers and a case hardened shackle of a minimum of 3/8-inch diameter is sufficient for locking purposes.

WAC 296-52-70070 Detonator day box. A detonator day box is a temporary storage facility for detonators in quantities of one thousand or less.

(1) **Construction materials.** Sides, bottoms, and covers must be:

- Constructed of number 12 gauge metal
- Lined with nonsparking material

(2) Hinges and hasps must be attached by:

- Welding
- Riveting

OR

- Bolting nuts on the inside of the door

(3) A single five tumbler lock must be used to lock the detonator day box.

HEATING SYSTEMS

WAC 296-52-70080 Magazine heating system requirements. Magazine heating system requirements and the following apply:

(1) **Heat sources.** Magazines requiring heat must be heated by either:

- Hot water radiant heating

OR

- Air directed into the magazine building by hot water or low pressure steam (15 psig) coils located outside the magazine building

(2) **Heating systems.** Magazine heating systems must meet the following requirements:

(a) The radiant heating coils in the building must be installed where explosive materials or their containers cannot touch the coils and air is free to circulate between the coils and the explosive material containers.

(b) The heating ducts must be installed where the hot air released from a duct is not directed toward the explosive material or containers.

(c) The heating device used in connection with a magazine must have controls, to prevent the building temperature from exceeding 130ºF.

(d) The electric fan or pump used in the heating system for a magazine must be:

- Mounted outside
- Separate from the wall of the magazine
- Grounded

(e) **Electric motor, device controls, and electric switch gear.**

(i) The electric fan motor and the controls for electrical heating devices used in heating water or steam must have overloads and disconnects which comply with the National Electrical Code, (NFPA Number 70-1992).

(ii) All electrical switch gear must be located a minimum distance of twenty-five feet from the magazine.

(f) **Water or steam heating source.**

(i) A heating source for water or steam must be separated from a magazine by a distance of at least:

- Twenty-five feet when the heating source is electrical
- Fifty feet when the heating source is fuel fired

(ii) The area between a heating unit and a magazine cannot contain combustible materials.

(g) The storage of explosive material containers in the magazine must allow for uniform air circulation, so temperature uniformity can be maintained throughout the explosive materials.

WAC 296-52-70085 Lighting.

(1) Battery activated safety lights or lanterns may be used in explosive storage magazines.

(2) **National Fire Protection Association (NFPA) Standards.**

(a) Electric lighting used in an explosive storage magazine must meet National Electric Code (NEC) standards (NFPA 70-1992) for all magazine conditions.

(b) All electrical switches must:

- Be located outside the magazine
- Meet NEC standards.